

# IRRIGATION WATER MANAGEMENT

(Acre)  
Code 449

Natural Resources Conservation Service  
Conservation Practice Standard

## I. Definition

Irrigation water management is the process of determining and controlling the volume, frequency, and application rate of irrigation water in a planned, efficient manner.

## II. Purpose

Irrigation water management is applied as part of a conservation management system to support one or more of the following:

- Manage soil moisture to promote desired crop response
- Optimize use of available water supplies
- Decrease non-point source pollution of surface and groundwater resources
- Manage air, soil, or plant micro-climate.

## III. Conditions Where Practice Applies

This practice is applicable to all irrigated lands.

An irrigation system adapted for site conditions (soil, slope, crop grown, climate, water quantity and quality, etc.) must be available and capable of applying water to meet the intended purpose(s).

## IV. Federal, State, and Local Laws

Irrigation water management shall comply with all federal, state and local laws, rules or regulations. The operator is responsible for securing required permits. This standard does not contain the text of federal, state or local laws governing irrigation water management.

## V. Criteria

### A. General Criteria Applicable to All Purposes

Water shall not be applied in excess of the needs to meet the intended purpose.

### B. Additional Criteria to Manage Soil Moisture to Promote Desired Crop Response

The following principles shall be applied for various crop growth stages:

- The volume of water needed for each irrigation shall be based on plant available water holding capacity of the soil for the crop rooting depth, management allowed soil water depletion, irrigation efficiency, and water table contribution.
- The irrigation frequency shall be based on the volume of irrigation water needed and/or available, the rate of crop evapotranspiration, and effective precipitation.
- The application rate shall be based on the volume of water to be applied, the frequency of irrigation applications, soil infiltration and permeability characteristics, and the capacity of the irrigation system.

### C. Additional Criteria to Optimize Use of Water Supplies

Limited irrigation water supplies shall be managed to meet critical crop growth stages.

### D. Additional Criteria to Decrease Non-Point Source Pollution of Surface and Groundwater Resources

Water application shall be at rates that minimize transport of sediment, nutrients, and chemicals to surface waters and that minimize transport of nutrients and chemicals to groundwater.

**E. Additional Criteria to Manage Air, Soil, or Plant Micro-Climate**

The irrigation system shall have the capacity to apply the required rate of water for cold or heat protection as determined by the methodology contained in National Engineering Handbook (NEH), Part 623, Chapter 2.

**VI. Considerations**

Additional recommendations relating to design that may enhance the use of, or avoid problems with, this practice but are not required to ensure its basic conservation functions are as follows.

- A. Consideration should be given to managing precipitation effectiveness, crop residues, and reducing system losses.
- B. Modify plant populations, crop and variety selection, and irrigated acres to match available or anticipated water supplies.
- C. Consider potential for spray drift and odors when applying agricultural and municipal waste waters.
- D. Consider the quality of water and the potential impact to crop quality and plant development.
- E. Quality of irrigation water should be considered relative to its potential effect on the soil's physical and chemical properties, such as soil crusting, pH, permeability, and structure.
- F. Avoid traffic on wet soils to minimize soil compaction.
- G. Consider the effects that irrigation water has on wetlands, water related wildlife habitats, riparian areas, cultural resources, and recreation opportunities.
- H. Management of nutrients and pesticides.
- I. Water should be managed in such a manner as to not drift or come in direct contact with surrounding electrical lines, supplies, devices, controls, or components that would cause shorts in the same or the creation of an electrical safety hazard to humans or animals.
- J. Consideration should be given to electrical load control/interruptible power schedules, repair and maintenance downtime, and harvest downtime.

- K. Consider improving the irrigation system to increase distribution uniformity of irrigation water application.

**VII. Plans and Specifications**

Application of this standard may include job sheets or similar documents that specify the applicable requirements, system operations, and components necessary for applying and maintaining the practice to achieve its intended purpose(s).

**VIII. Operation and Maintenance**

There are no operation and maintenance (O&M) aspects applicable to this standard. Necessary O&M items are addressed in the physical component standards considered companions to this standard.

**IX. References**

USDA, NRCS, Wisconsin Field Office Technical Guide, Section IV, Conservation Practice Standards and Specifications.

USDA, NRCS, National Engineering Handbook, Part 623, Irrigation.

USDA, NRCS, National Engineering Handbook, Part 652, Irrigation Guide.